# EPA KEY CONTACTS FORM

OMB Number: 2030-0020
Expiration Date: 06/30/2024

**Authorized Representative:** *Original awards and amendments will be sent to this individual for review and acceptance, unless otherwise indicated.*

**Name:** Prefix: | First Name: Paula | Middle Name:
Last Name: Kaloyeros | Suffix:
**Title:** Asst Vice President for Sponsored Programs Ad

**Complete Address:**

Street1: 1400 Washington Ave MSC 100
Street2:
City: Albany | State: NY: New York
Zip / Postal Code: 12222 | Country: USA: UNITED STATES
**Phone Number:** 5184423196 | **Fax Number:**
**E-mail Address:** preaward@albany.edu

**Payee:** *Individual authorized to accept payments.*

**Name:** Prefix: | First Name: Erin | Middle Name: L
Last Name: Lupe | Suffix:
**Title:**

**Complete Address:**

Street1: 1400 Washington Ave., MSC100A
Street2:
City: Albany | State: NY: New York
Zip / Postal Code: 12222-0100 | Country: USA: UNITED STATES
**Phone Number:** 5184373892 | **Fax Number:**
**E-mail Address:** elupe@albany.edu

**Administrative Contact:** *Individual from Sponsored Programs Office to contact concerning administrative matters (i.e., indirect cost rate computation, rebudgeting requests etc).*

**Name:** Prefix: | First Name: Jessie | Middle Name: L
Last Name: Beauharnois | Suffix:
**Title:**

**Complete Address:**

Street1: 1400 Washington Ave., MSC100A
Street2:
City: Albany | State: NY: New York
Zip / Postal Code: 12222-0100 | Country: USA: UNITED STATES
**Phone Number:** 5184373833 | **Fax Number:**
**E-mail Address:** goldteam@albany.edu

# EPA KEY CONTACTS FORM

**Project Manager:** *Individual responsible for the technical completion of the proposed work.*

**Name:** Prefix: Dr. First Name: Jie Middle Name:

Last Name: Zhang Suffix:

**Title:**

**Complete Address:**

Street1: 1220 Washington Ave.

Street2: ETEC Bldg

City: Albany State: NY: New York

Zip / Postal Code: 12222-0100 Country: USA: UNITED STATES

**Phone Number:** 518-469-0037 **Fax Number:**

**E-mail Address:** jzhang35@albany.edu

OMB Number: 2030-0020
Expiration Date: 06/30/2024

# Preaward Compliance Review Report for All Applicants and Recipients Requesting EPA Financial Assistance

Note: Read Instructions before completing form.

**I. A. Applicant/Recipient (Name, Address, City, State, Zip Code)**

Name: The Research Foundation for the SUNY, University at Albany

Address: 1400 Washington Ave. MSC 100A

City: Albany

State: NY: New York Zip Code: 122220100

**B. DUNS No.** 152652822

**II. Is the applicant currently receiving EPA Assistance?** ☐ Yes ☒ No

**III. List all civil rights lawsuits and administrative complaints pending against the applicant/recipient that allege discrimination based on race, color, national origin, sex, age, or disability. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7.)**

- Alexander M. v. Cleary, et al., Index No. AD No. 528959 (NY Supreme Court, Appellate Division, Third Department) - Pending.
- Alaei, Kamiar v. UAlbany, et al., No. 1:21-cv-0037 (U.S. District Court, North District of New York) - Pending.
- COMPLAINANT NAME CONFIDENTIAL, OCR Case No. 02-21-2193 (U.S. Department of Education, Office for Civil Rights) - Pending.
- COMPLAINANT NAME CONFIDENTIAL, OCR Case No. 02-22-2020 (U.S. Department of Education, Office for Civil Rights) - Pending.
- COMPLAINANT NAME CONFIDENTIAL, OCR Case No. 02-20-2347 (U.S. Department of Education, Office for Civil Rights) - Pending.
- Heim v. Daniel, et al., No. 1:18-cv-00836 (U.S. District Court, North District of New York) - Pending.
- Pejovic, et al. v. UAlbany, et al.,No. 21-1927 (U.S. Court of Appeals, 2nd Circuit) - Pending.
- Willis v. New York State, State University of New York at Albany, DHR Case No. 10213333 (NY Division of Human Rights) - Pending.

**IV. List all civil rights lawsuits and administrative complaints decided against the applicant/recipient within the last year that allege discrimination based on race, color, national origin, sex, age, or disability and enclose a copy of all decisions. Please describe all corrective actions taken. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7.)**

None

**V. List all civil rights compliance reviews of the applicant/recipient conducted by any agency within the last two years and enclose a copy of the review and any decisions, orders, or agreements based on the review. Please describe any corrective action taken. (40 C.F.R. § 7.80(c)(3))**

None

**VI. Is the applicant requesting EPA assistance for new construction? If no, proceed to VII; if yes, answer (a) and/or (b) below.**

☐ Yes ☒ No

**a. If the grant is for new construction, will all new facilities or alterations to existing facilities be designed and constructed to be readily accessible to and usable by persons with disabilities? If yes, proceed to VII; if no, proceed to VI(b).**

☐ Yes ☐ No

**b. If the grant is for new construction and the new facilities or alterations to existing facilities will not be readily accessible to and usable by persons with disabilities, explain how a regulatory exception (40 C.F.R. 7.70) applies.**

VII. **Does the applicant/recipient provide initial and continuing notice that it does not discriminate on the basis of race, color, national origin, sex, age, or disability in its program or activities? (40 C.F.R 5.140 and 7.95)** ☒ Yes ☐ No

a. **Do the methods of notice accommodate those with impaired vision or hearing?** ☒ Yes ☐ No

b. **Is the notice posted in a prominent place in the applicant's offices or facilities or, for education programs and activities, in appropriate periodicals and other written communications?** ☒ Yes ☐ No

c. **Does the notice identify a designated civil rights coordinator?** ☒ Yes ☐ No

VIII. **Does the applicant/recipient maintain demographic data on the race, color, national origin, sex, age, or handicap of the population it serves? (40 C.F.R. 7.85(a))** ☒ Yes ☐ No

IX. **Does the applicant/recipient have a policy/procedure for providing access to services for persons with limited English proficiency? (40 C.F.R. Part 7, E.O. 13166)** ☒ Yes ☐ No

X. **If the applicant is an education program or activity, or has 15 or more employees, has it designated an employee to coordinate its compliance with 40 C.F.R. Parts 5 and 7? Provide the name, title, position, mailing address, e-mail address, fax number, and telephone number of the designated coordinator.**

Samuel Caldwell, MBA, Chief Diversity Officer and Assistant Vice President for Diversity and Inclusion: University Hall 207, 1400 Washington Ave, Albany, NY 12222-0100; sjcaldwell@albany.edu; 518-956-8110

XI. **If the applicant is an education program or activity, or has 15 or more employees, has it adopted grievance procedures that assure the prompt and fair resolution of complaints that allege a violation of 40 C.F.R. Parts 5 and 7? Provide a legal citation or Internet Address for, or a copy of, the procedures.**

https://www.albany.edu/diversityandinclusion/equalopportunity.php

**For the Applicant/Recipient**

I certify that the statements I have made on this form and all attachments thereto are true, accurate and complete. I acknowledge that any knowingly false or misleading statement may be punishable by fine or imprisonment or both under applicable law. I assure that I will fully comply with all applicable civil rights statutes and EPA regulations.

| A. Signature of Authorized Official | B. Title of Authorized Official | C. Date |
|---|---|---|
| Jessie Beauharnois | Associate Director, SPA | 03/25/2022 |

**For the U.S. Environmental Protection Agency**

I have reviewed the information provided by the applicant/recipient and hereby certify that the applicant/recipient has submitted all preaward compliance information required by 40 C.F.R. Parts 5 and 7; that based on the information submitted, this application satisfies the preaward provisions of 40 C.F.R. Parts 5 and 7; and that the applicant has given assurance that it will fully comply with all applicable civil rights statures and EPA regulations.

| A. *Signature of Authorized EPA Official | B. Title of Authorized Official | C. Date |
|---|---|---|
| | | |

*** See Instructions**

Instructions for EPA FORM 4700-4 (Rev. 06/2014)

General. Recipients of Federal financial assistance from the U.S. Environmental Protection Agency must comply with the following statutes and regulations.
Title VI of the Civil Rights Acts of 1964 provides that no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. The Act goes on to explain that the statute shall not be construed to authorize action with respect to any employment practice of any employer, employment agency, or labor organization (except where the primary objective of the Federal financial assistance is to provide employment). Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act provides that no person in the United States shall on the ground of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under the Federal Water Pollution Control Act, as amended. Employment discrimination on the basis of sex is prohibited in all such programs or activities. Section 504 of the Rehabilitation Act of 1973 provides that no otherwise qualified individual with a disability in the United States shall solely by reason of disability be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. Employment discrimination on the basis of disability is prohibited in all such programs or activities. The Age Discrimination Act of 1975 provides that no person on the basis of age shall be excluded from participation under any program or activity receiving Federal financial assistance. Employment discrimination is not covered. Age discrimination in employment is prohibited by the Age Discrimination in Employment Act administered by the Equal Employment Opportunity Commission. Title IX of the Education Amendments of 1972 provides that no person in the United States on the basis of sex shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance. Employment discrimination on the basis of sex is prohibited in all such education programs or activities. Note: an education program or activity is not limited to only those conducted by a formal institution. 40 C.F.R. Part 5 implements Title IX of the Education Amendments of 1972. 40 C.F.R. Part 7 implements Title VI of the Civil Rights Act of 1964, Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act, and Section 504 of The Rehabilitation Act of 1973. The Executive Order 13166 (E.O. 13166) entitled; "Improving Access to Services for Persons with Limited English Proficiency" requires Federal agencies work to ensure that recipients of Federal financial assistance provide meaningful access to their LEP applicants and beneficiaries.

Items "Applicant" means any entity that files an application or unsolicited proposal or otherwise requests EPA assistance. 40 C.F.R. §§ 5.105, 7.25. "Recipient" means any entity, other than applicant, which will actually receive EPA assistance. 40 C.F.R. §§ 5.105, 7.25. "Civil rights lawsuits and administrative complaints" means any lawsuit or administrative complaint alleging discrimination on the basis of race, color, national origin, sex, age, or disability pending or decided against the applicant and/or entity which actually benefits from the grant, but excluding employment complaints not covered by 40 C.F.R. Parts 5 and 7. For example, if a city is the named applicant but the grant will actually benefit the Department of Sewage, civil rights lawsuits involving both the city and the Department of Sewage should be listed. "Civil rights compliance review" means any review assessing the applicant's and/or recipient's compliance with laws prohibiting discrimination on the basis of race, color, national origin, sex, age, or disability. Submit this form with the original and required copies of applications, requests for extensions, requests for increase of funds, etc. Updates of information are all that are required after the initial application submission. If any item is not relevant to the project for which assistance is requested, write "NA" for "Not Applicable." In the event applicant is uncertain about how to answer any questions, EPA program officials should be contacted for clarification. * Note: Signature appears in the Approval Section of the EPA Comprehensive Administrative Review For Grants/Cooperative Agreements & Continuation/Supplemental Awards form.

## Other Attachment File(s)

*** Mandatory Other Attachment Filename:** 1235-EPA-OAR-OAQPS-22-01-RFSUNY-Zhang-Final_Attach

Add Mandatory Other Attachment | Delete Mandatory Other Attachment | View Mandatory Other Attachment

To add more "Other Attachment" attachments, please use the attachment buttons below.

Add Optional Other Attachment | Delete Optional Other Attachment | View Optional Other Attachment

## Project Narrative File(s)

*** Mandatory Project Narrative File Filename:** 1234-EPA-OAR-OAQPS-22-01-RFSUNY-Zhang-Final-V3.pdf

Add Mandatory Project Narrative File | Delete Mandatory Project Narrative File | View Mandatory Project Narrative File

To add more Project Narrative File attachments, please use the attachment buttons below.

Add Optional Project Narrative File | Delete Optional Project Narrative File | View Optional Project Narrative File

# BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 02/28/2022

## SECTION A - BUDGET SUMMARY

| Grant Program Function or Activity (a) | Catalog of Federal Domestic Assistance Number (b) | Estimated Unobligated Funds | | New or Revised Budget | | |
|---|---|---|---|---|---|---|
| | | Federal (c) | Non-Federal (d) | Federal (e) | Non-Federal (f) | Total (g) |
| 1. NY Capital District communities air quality measurement network with community school-based low sensors & high precision | 66.034 | $ | $ | $ 499,032.00 | $ 0.00 | $ 499,032.00 |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. Totals | | $ | $ | $ 499,032.00 | $ 0.00 | $ 499,032.00 |

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## SECTION B - BUDGET CATEGORIES

| 6. Object Class Categories | GRANT PROGRAM, FUNCTION OR ACTIVITY (1) | (2) | (3) | (4) | Total (5) |
|---|---|---|---|---|---|
| | NY Capital District communities air quality measurement network with community school-based low sensors & high precision | | | | |
| a. Personnel | $ 138,520.00 | $ | $ | $ | $ 138,520.00 |
| b. Fringe Benefits | 28,890.00 | | | | 28,890.00 |
| c. Travel | 10,324.00 | | | | 10,324.00 |
| d. Equipment | 61,050.00 | | | | 61,050.00 |
| e. Supplies | 6,000.00 | | | | 6,000.00 |
| f. Contractual | 50,000.00 | | | | 50,000.00 |
| g. Construction | | | | | |
| h. Other | 67,668.00 | | | | 67,668.00 |
| i. Total Direct Charges (sum of 6a-6h) | 362,452.00 | | | | $ 362,452.00 |
| j. Indirect Charges | 136,580.00 | | | | $ 136,580.00 |
| k. TOTALS (sum of 6i and 6j) | $ 499,032.00 | $ | $ | $ | $ 499,032.00 |
| | | | | | |
| 7. Program Income | $ | $ | $ | $ | $ |

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## SECTION C - NON-FEDERAL RESOURCES

| (a) Grant Program | (b) Applicant | (c) State | (d) Other Sources | (e)TOTALS |
|---|---|---|---|---|
| 8. NY Capital District communities air quality measurement network with community school-based low sensors & high precision | $ 499,032.00 | $ 0.00 | $ 0.00 | $ 499,032.00 |
| 9. | | | | |
| 10. | | | | |
| 11. | | | | |
| 12. TOTAL (sum of lines 8-11) | $ 499,032.00 | $ 0.00 | $ 0.00 | $ 499,032.00 |

## SECTION D - FORECASTED CASH NEEDS

| | Total for 1st Year | 1st Quarter | 2nd Quarter | 3rd Quarter | 4th Quarter |
|---|---|---|---|---|---|
| 13. Federal | $ 240,370.00 | $ 97,798.00 | $ 47,524.00 | $ 47,524.00 | $ 47,524.00 |
| 14. Non-Federal | $ | | | | |
| 15. TOTAL (sum of lines 13 and 14) | $ 240,370.00 | $ 97,798.00 | $ 47,524.00 | $ 47,524.00 | $ 47,524.00 |

## SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

| (a) Grant Program | FUTURE FUNDING PERIODS (YEARS) (b)First | (c) Second | (d) Third | (e) Fourth |
|---|---|---|---|---|
| 16. NY Capital District communities air quality measurement network with community school-based low sensors & high precision | $ 240,370.00 | $ 216,087.00 | $ 42,575.00 | $ |
| 17. | | | | |
| 18. | | | | |
| 19. | | | | |
| 20. TOTAL (sum of lines 16 - 19) | $ 240,370.00 | $ 216,087.00 | $ 42,575.00 | $ |

## SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges: Other: Tuition, Pubs, Community school project act

22. Indirect Charges: MTDC 56.5%on MTDC Base $241,734

23. Remarks:

OMB Number: 4040-0004
Expiration Date: 12/31/2022

## Application for Federal Assistance SF-424

| * 1. Type of Submission: | * 2. Type of Application: | * If Revision, select appropriate letter(s): |
|---|---|---|
| ☐ Preapplication | ☒ New | |
| ☒ Application | ☐ Continuation | * Other (Specify): |
| ☐ Changed/Corrected Application | ☐ Revision | |

| * 3. Date Received: | 4. Applicant Identifier: |
|---|---|
| 03/25/2022 | NHH3T1Z96H29 |

| 5a. Federal Entity Identifier: | 5b. Federal Award Identifier: |
|---|---|
| | |

**State Use Only:**

| 6. Date Received by State: | 7. State Application Identifier: |
|---|---|
| | |

**8. APPLICANT INFORMATION:**

| | |
|---|---|
| * a. Legal Name: | The Research Foundation for the SUNY, UAlbany |

| * b. Employer/Taxpayer Identification Number (EIN/TIN): | * c. Organizational DUNS: |
|---|---|
| 141368361 | 1526528220000 |

**d. Address:**

| | |
|---|---|
| * Street1: | 1400 Washington Ave., MSC100A |
| Street2: | |
| * City: | Albany |
| County/Parish: | |
| * State: | NY: New York |
| Province: | |
| * Country: | USA: UNITED STATES |
| * Zip / Postal Code: | 12222-0100 |

**e. Organizational Unit:**

| Department Name: | Division Name: |
|---|---|
| | |

**f. Name and contact information of person to be contacted on matters involving this application:**

| | | | |
|---|---|---|---|
| Prefix: | | * First Name: | Jessie |
| Middle Name: | | | |
| * Last Name: | Beauharnois | | |
| Suffix: | | | |

| | |
|---|---|
| Title: | |
| Organizational Affiliation: | |
| * Telephone Number: | 518-437-3833 |
| Fax Number: | |
| * Email: | resadmin@albany.edu |

## Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

M: Nonprofit with 501C3 IRS Status (Other than Institution of Higher Education)

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Environmental Protection Agency

**11. Catalog of Federal Domestic Assistance Number:**

66.034

CFDA Title:

Surveys, Studies, Research, Investigations, Demonstrations, and Special Purpose Activities Relating to the Clean Air Act

*** 12. Funding Opportunity Number:**

EPA-OAR-OAQPS-22-01

* Title:

Enhanced Air Quality Monitoring for Communities

**13. Competition Identification Number:**

Title:

**14. Areas Affected by Project (Cities, Counties, States, etc.):**

Add Attachment | Delete Attachment | View Attachment

*** 15. Descriptive Title of Applicant's Project:**

NY Capital District communities air quality measurement network based on low-cost sensors with community schools as sites and mobile lab measurements

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

## Application for Federal Assistance SF-424

**16. Congressional Districts Of:**

* a. Applicant: NY-020 * b. Program/Project: NY-020

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment | Delete Attachment | View Attachment

**17. Proposed Project:**

* a. Start Date: 04/01/2023 * b. End Date: 09/30/2025

**18. Estimated Funding ($):**

| | |
|---|---|
| * a. Federal | 499,032.00 |
| * b. Applicant | 0.00 |
| * c. State | 0.00 |
| * d. Local | 0.00 |
| * e. Other | 0.00 |
| * f. Program Income | 0.00 |
| * g. TOTAL | 499,032.00 |

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☐ a. This application was made available to the State under the Executive Order 12372 Process for review on .

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☒ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

☐ Yes ☒ No

If "Yes", provide explanation and attach

Add Attachment | Delete Attachment | View Attachment

**21. *By signing this application, I certify (1) to the statements contained in the list of certifications** and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

**Authorized Representative:**

Prefix: * First Name: Jessie

Middle Name:

* Last Name: Beauharnois

Suffix:

* Title: Associate Director, SPA

* Telephone Number: 518-437-3833 Fax Number:

* Email: goldteam@albany.edu

* Signature of Authorized Representative: Jessie Beauharnois * Date Signed: 03/25/2022

## Cover Page

**Project Title:** NY Capital District communities air quality measurement network with community school-based low-cost sensors and high precision mobile lab measurements

**Applicant Information:**


- **PI**: Dr. Jie Zhang; **Co-PI**: Md. Aynul Bari
- **Applicant Organization:** The Research Foundation for the SUNY
- **Address:** 1400 Washington Ave., MSC 100A, Albany, NY 12222-0100
- **Primary contact name:** Ms. Jessie L. Beauharnois**; Phone number:** 518-437-3833**; E-mail address:** jbeauharnois@albany.edu
- **DUNS number: 152652822/UEI: NHH3T1Z96H29**


**Set-Aside:** no set-aside

**Brief Description of Applicant Organization:** The Research Foundation for the State University of New York (RFSUNY) is a private, non-profit, 501(c)(3) educational institution created in 1951 to administer the grant and sponsored program activities on behalf of the SUNY System Administration. The RFSUNY acts as the fiscal agent for all externally sponsored funds received at each SUNY campus.

**Project Partner(s):** Healthy Schools Network; Partner Primary Contact Name: Claire L. Barnett

**Project Locations:**

- North-east Albany, Albany, NY, 12210
- South Albany, Albany, NY, 12202
- North-west Albany, Albany, NY, 12206
- North Troy, Troy, NY, 12180
- East Schenectady, Schenectady, NY 12304

**Air Pollutant Scope:** CO, NO, $NO_2$, $O_3$, Particulate matter (PM), Speciated volatile organic compounds (VOCs), PM chemical composition

**Budget Summary:**

| EPA Funding Requested | Total Project Cost |
|---|---|
| $499,032 | $499,032 |

**Project Period:** April 2023-Sep. 2025

**Short Project Description:** A NY Capital District communities air quality measurement network will be built based on low-cost sensors outdoor/indoor measurements with five community schools as sites and supplemented by mobile lab measurements. Analysis of these measurements will provide air pollution outdoor/indoor exposure estimations and promote policies and practices to improve air quality and health outcomes.

## Workplan

### Section 1– Project Summary and Approach

### *A. Overall project*

Studies have identified significant differences in the spatial distribution of air pollutants, including $O_3$, $NO_2$, particulate matter impacted by local sources (e.g., traffic, local industries, etc.), and these are in turn associated with a relatively higher heath exposure for the underserved and low-income communities (Freudenberg et al., 2011; Bell et al., 2012; Kerr et al., 2021). This highlights the necessity of monitoring air quality in these underserved communities, as stated in the RFA. Most of these communities have been excluded from ((i.e., not chosen as sites for) the current routine regulatory monitoring stations due to the limited number of such stations due to their cost, infrastructure, and personnel requirements (Jiao et al., 2015). To optimize the air quality measurements for a larger number of communities, low-cost air quality sensors systems/packages are deployed more frequently due to their ability to make criteria air pollutant continuous measurements with acceptable reliability. These measurements in under-sampled areas will help to identify the local air pollution in the communities and promote the community's environmental awareness (Jiao et al., 2015).

While there is an increasingly widespread use of low-cost-sensors systems/packages for determining community air quality, the communities sampled are mainly located in large urban metro areas; and the geographic coverage of the measurements is still limited for the communities in the relatively small urban regions who also suffer adverse health exposures. Meanwhile, knowledge gaps still exist for the penetration of the community outdoor air pollutants into the indoor atmosphere, where people spend most of their time each day.

To address the above issues, we propose to build an enhanced air quality measurement network in and near underserved and low-income communities in the Capital Region of New York State using one kind of low-cost-sensors package. Community schools are chosen as the sites for both outdoor and indoor measurements, based on the considerations that 1) community schools have the most clustered young people during the daytime; 2) outdoor air pollutants exposure levels from the community schools could generally represent the whole community; and 3) the indoor air pollutant levels could help to identify the influence and the penetration of outside air pollutants to the indoor and the related indoor exposure. Five communities (as shown in **Fig. 1**) are proposed to be selected based on the EPA's Environmental Justice Screening and Mapping Tool (https://ejscreen.epa.gov/mapper/) and the study is proposed to take place for a 2-year period of continuous measurements of criteria air pollutants (i.e., $PM_{2.5}$, ozone, carbon monoxide, and nitrogen dioxide) for both indoor and outdoor concentrations and exposures.

In addition, our well-equipped mobile lab with several high-precision instruments will be used for shorter-term measurement deployments during summer/winter seasons (5 days for each site, and a total of 25 days each summer/winter season) combining road-side (parked) measurements and on-road measurements. These will provide additional air pollutant information to complement the low-cost air quality measurement network. This more precise and accurate data is useful in the following ways: 1) the aerosol chemical component mass concentrations can be obtained from the HR-ToF-AMS for identifying the aerosol sources and chemical processing, 2) the VOC species collected by the canisters and analyzed by the special lab and also analyzed by auto-GC provide a

complementary window onto the burden of air pollution at or near the sites, 3) the aerosol size distribution measured by the SMPS is also important for the throat and lung deposition of suspended aerosols, and 4) the community spatial air quality difference though on-road measurements help quantify the spatial heterogeneity of the locations. All of them will provide valuable air pollutant data for a comprehensive understanding of community air pollution at and near the measurement sites. Meanwhile, when parking at schools, its measurements will be used to calibrate the low-cost sensors in order to minimize the interference by other parameters, such as RH, temperature, etc.

Our proposal team is well-positioned to perform this work due to our extensive experience in measuring ozone, particulate matter, precursor gases, and metrological parameters. The project will develop these new and important data to capture more detailed information of the underserved community air quality, and the results will be reported to EPA, the local communities, the local government environmental management department (e.g., NYS DEC, County Health Departments), will be presented to a more widespread audience at the national scientific conferences (e.g., AGU), and will be published through scientific papers in peer-reviewed journals. Meanwhile, we also propose to organize several community information and exhibit activities to spread basic air quality knowledge to the communities and promote their awareness of the surrounding air pollution and organize a workshop/discussion meeting including community public and NYS environmental department to build a connection between stakeholders, to highlight the air quality issues to the government, and to provide guidance that will help regulators and communities enact policies to reduce air pollutant emissions and better the air quality.

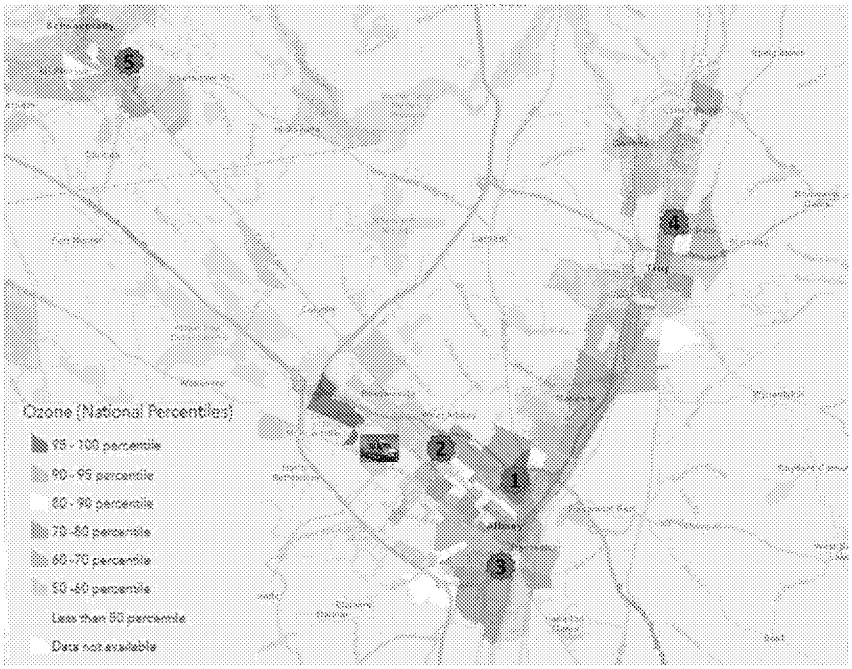


**Figure 1.** The map for the five selected communities (The mobile lab pic shows the location of our ASRC center, acting as a reference site)

### *B. Project Significance*

Throughout the United States, lower-income, minority, and marginalized populations experience

higher pollution exposure levels and associated adverse health effects. These communities often live near major air pollution sources, including industrial facilities, major roadways, and ports. As a result, these populations have been shown to experience more air pollution than they cause (UNEP, 2022). In this proposed study, we use the EPA's EJSCREEN tool to identify five underserved communities with high air pollution levels in the NY capital region. The data and results from this project will be shown to the community committees to increase awareness of their surrounding air quality burdens. Meanwhile, it will also be presented at annual scientific conferences and journals to attract attention from the scientific community. More importantly, it will be shown to the NYS environmental conservation and protection departments to point out the air pollution exposure levels for these underserved communities, the air pollutant sources, the possible ways to reduce the source emissions and any additional changes that can help to reduce the air pollution burden in such underserved communities.

## Section 2 – Community Involvement

### *A. Community Partnerships*

Our primary sub-contractor will be the 501c(3) non-profit organization- Healthy Schools Network (hereafter HS Network). Since its founding in NYS in 1995, Healthy Schools Network has worked to secure new laws, funding, and regulations to promote healthier school environments, including testing for lead in school drinking water, policies to protect occupant health in schools under renovation, a notice of pesticide use, bans on arsenic and elemental mercury, and an executive order and law requiring all state agencies and public and private schools to use green cleaning products. For this proposal, the HS Network will help us to (1) review and advise on selecting local schools (2) participate in creating and editing flyers or literature to share with local schools to explain the project and why how it will benefit schools, personnel, and students, and how schools can participate, (3) convene a Capital District community advisory group to encourage/steer the local work, and (4) submit timely reports on its activity on behalf of the project for required quarterly/final reports.

Besides our primary sub-contractor, five community schools will be engaged to join our project as important partners for hosting the instruments, helping with the project information activities, and helping to keep the instruments safe. The five first-choice community schools are:
1. North Albany Middle School, for Region 1 in Fig. 1.
2. Harriet Gibbons School, for Region 2 in Fig. 1.
3. Giffen Memorial School, for Region 3 in Fig. 1.
4. Uncommon Schools Troy Prep Elementary, for Region 4 in Fig. 1.
5. Central Park Middle School, for Region 5 in Fig. 1.

(Note: these five schools are the first choice, and substitutable ones with locations near the five regions may be used depending on agreements with school leaders (principals & superintendents). Any substitutes will be reported to EPA if necessary.)

### *B. Community Engagement*

HS Network, in consultation with the PIs, will develop community engagement as shown in **Fig. 2** below, involving three types of activity. The **first** activity will be for the community at large, and HS Network will organize two community information sessions, one each year: an

introductory/start-up session, and a final wrap-up session. These project information sessions will include a presentation from the PIs to educate the public on the basics of air pollution and human health, and which pollutants the study will be tracking. HS Network will also help draft and edit pre-informational flyers to share with the communities and schools to encourage wider public interest and support. The **second** set of activities will involve the community advisory committee. When there is a final list of project schools, HS Network will work with the PIs to invite representatives of those schools (principal, facility director, parents, school nurse, union leader) to join a single Capital District-wide advisory group that will meet at least 2x per year to learn about the project and progress. The PIs with HS Network will share and discuss the quarterly and final project results with this committee and the wider school community to provide information on any likely sources of major pollutants found outside and inside the schools and the air pollution exposure levels. Results shared with the community will also be communicated to presented to national audiences through conferences, and the NYS Dept of Environmental Conservation and other local government departments in a joint meeting at the end of the project hosted by the PI and the HS Network("the **third** type of activity"). Community engagement is an important step that will help lead to the reduction of air pollutant levels in these NY capital region communities and improve air quality and health for these underserved communities.

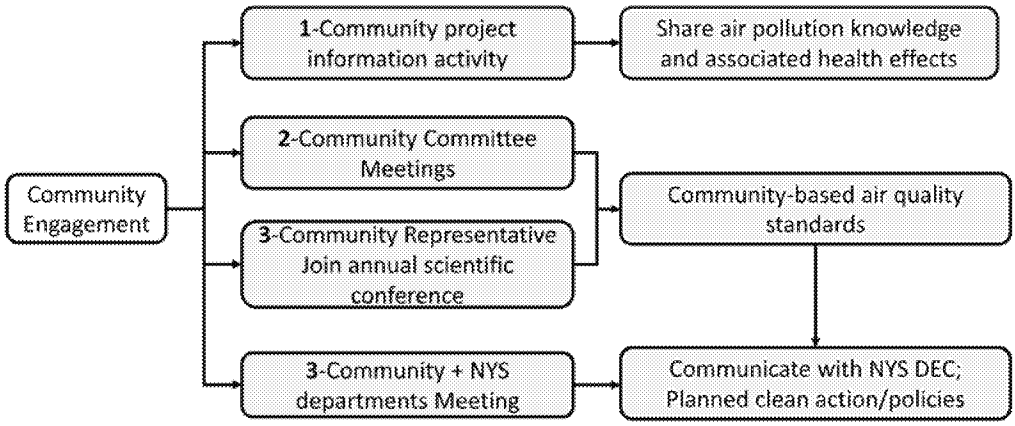


**Figure 2.** The community engagement frames

## Section 3 – Environmental Justice and Underserved Communities

The five communities were selected based on the combination of several indices (**Table 1**) from the EPA's Environmental Justice Screening and Mapping Tool, and all of them are identified as low-income and affected by the air pollutants $PM_{2.5}$ and $O_3$ with national percentiles over 80%. They also have high ratios for asthma (their national percentiles are over 85%). Numerous studies have shown the role of air pollutants in the causation of asthma and lung cancer (Kett et al., 2018). Thus, the proposed measurements will provide an important dataset of air pollutants, and the project team will perform a comprehensive data analysis based on the measured data to identify the pollution sources and their temporal variation, and easy-to-follow presentations to the communities to help them realize the potential vulnerability to these environmental burdens. Meanwhile, this greater understanding will build a connection between the communities and the local environmental management departments, and also in turn help scientists, regulators, and policymakers to be better informed and make more effective policy decisions related to reducing $PM_{2.5}$ and ozone pollution that affects the residents of these communities. We also hope to develop

scientific advances in the field that can be used by other regions or groups facing similar issues.

**Table 1.** Several indices from the EPA's Environmental Justice Screening and Mapping Tool

| Num. | #1 | #2 | #3 | #4 | #5 |
|---|---|---|---|---|---|
| **EJ Index-$PM_{2.5}$** | 93%ile | 89%ile | 83%ile | 82% | 90% |
| **EJ Index-$O_3$** | 95%ile | 91%ile | 85%ile | 84%ile | 92%ile |
| **Demographic Index** | 86%(98%ile) | 80%(95%ile) | 95%(99%ile) | 72%(90%ile) | 63% (84%ile) |
| **Low Income** | 76%(96%ile) | 74%(96%ile) | 93%(99%ile) | 68%(93%ile) | 45% (75%ile) |
| **Asthma** | 13%(97%ile) | 11%(90%ile) | 15%(99%ile) | 11%(87%ile) | 12%(96%ile) |

## Section 4 – Environmental Results—Outcomes, Outputs and Performance Measures

### *A. Expected Project Outputs and Outcomes*

| | | |
|---|---|---|
| Outputs | Community air pollutant indoor/outdoor exposure estimates; temporal variation of exposure (diurnal, monthly, or seasonal); pollutant source identification | |
| | Two peer-reviewed papers; Quarterly progress reports | |
| | Presentations to the University at Albany (including ASRC), to EPA, NY capital district community advisory group, to NYS DEC, and to the audiences at one national conference | |
| | Open access datasets | |
| Outcomes | Short-term Outcomes | Promoting the community's awareness for the air quality they suffer and the different sources for the air pollutants impacting their communities |
| | Intermediate Outcomes | Building a connection between communities with NYS DEC; Improving community-based air quality guidelines; Guiding NYS DEC planning of clean-community-air policies |
| | Long-term Outcomes | Reducing the imbalance of air quality for the NY capital region communities; Improving the air quality and health for the underserved communities |

### *B. Performance Measures and Plan*

Our group has abundant experience in air quality monitoring, and we look forward to this opportunity to bring our skills and lessons learned to bear on this project. Critical to the proposed work is the Quantaq MODULAIR low-cost sensor packages (https://docs.quant-aq.com/modulair, **Fig. 3,**), which will provide real-time estimates of particulate matter concentrations ($PM_1$, $PM_{2.5}$, $PM_{10}$), five gas-phase measurements (CO, NO, $NO_2$, $O_3$), and some metrological parameters (temperature, and RH, etc) with a time resolution of 1mins. The size of MODULAIR is 11.04" x

9.04" x 5.72" with a weight of 6 lbs, and its operating temperature range is from -20 to 60 °C, which generally covers the annual temperature variation at Albany. More detailed information about the measurement range and accuracy from the user manual is shown in **Table 2**.

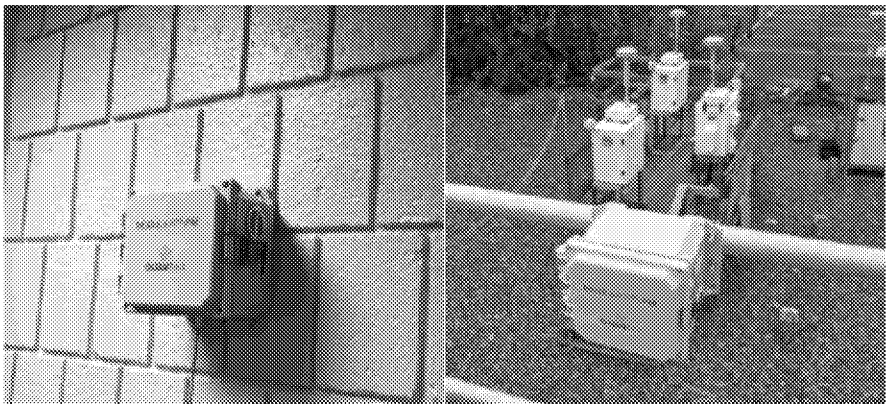

**Figure 3.** The photos of MODULAIR

**Table 2.** The range and accuracy of each measured species

| Parameter | Range | Accuracy |
|---|---|---|
| **$PM_1$, $PM_{2.5}$, $PM_{10}$** | 0-2000 μg/m$^3$ | 2.8, 1.3, 7.6 μg/m$^3$ |
| **$O_3$** | 0-500 ppb | 5 ppb or 20% |
| **CO** | 0-13000 ppb | 40 ppb or 20% |
| **NO** | 0-5000 ppb | 5 ppb or 20% |
| **$NO_2$** | 0-5000 ppb | 6 ppb or 35% |

For each community, one public school in/around the community will be chosen as the site for the MODULAIR packages, with one package outside of the building and another one inside. The PIs will submit the application to the Institutional Review Board (IRB) for exemption or approval if needed for the indoor measurements. The MODULAIR will be operated 24/7 continually for two full years (**Fig. 4** for the work plan). Meanwhile, the outdoor MODULAIR will be equipped with a Sonic Anemometer weather station sensor collecting the wind data (wind speed and wind direction), which would be useful for identifying the source direction for polluted plumes. Each school will be supplied with a video monitor to show the real-time air pollutant concentrations.

Besides the continuous long-term MODULAIR measurements, our well-fully equipped ASRC Sprinter Van Mobile Laboratory (**Fig. 5**) is proposed to be used for short-term intensive measurements. It is a flexible and powerful platform that can be configured to house many instruments and can be deployed for either on-road or roadside deployments. With an appropriate shore power connection, it can also park and measure in one location for days or even weeks. The heart of the power system is a set of eight Lithium-ion batteries with a fully charged capacity of 13.25 KWh, sufficient for measurement sorties of six hours or longer when fully charged (Battery lifetime depends on the power draw of deployed instruments and pumps, as well as the need for air conditioning that also runs on battery power). The mobile laboratory has one inlet for gases and one inlet for aerosols mounted over the driver seat to sample the slipstream as the vehicle is in

motion or parked near the desired measurement location. The ASRC mobile lab is proposed for 5 daytime measurements (during school time, **Fig. 4** for work plan) in each summer/winter season for each site with three days roadside measurements outside of the school building as a temporary station and two days of driving around the surrounding community to capture spatial differences. When finishing the community schools' measurements for each season, the instruments of the ASRC mobile lab will be moved into the ASRC shelter outside the University at Albany ETEC building for a continuous measurement as a reference measurement.

| Task | 2023Q2 | 2023Q3 | 2023Q4 | 2024Q1 | 2024Q2 | 2024Q3 | 2024Q4 | 2025Q1 | 2025Q2 | 2025Q3 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Calibration, Testing, and Integration | √ | | | | | | | | | |
| 2. Set up NY capital district community advisory group | √ | | | | | | | | | |
| 3. Project propagating and exhibit activities | √ | | | | | | | √ | | |
| 4. MODULAIR Deployment | | √ | √ | √ | √ | √ | √ | √ | √ | |
| 5. ASRC mobile lab Deployment | | √ | | √ | | √ | | √ | | |
| 6. Analysis and Synthesis of Data | | √ | √ | √ | √ | √ | √ | √ | √ | |
| 7. Presentations and Publications | | | | | | | √ | √ | √ | √ |
| 8. Reporting | | | | | | | | | | |
| Quarterly reports | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Presentations to project advisory Committee | | √ | | √ | | √ | | √ | | √ |
| Presentations to NY capital District community advisory committee | | √ | | √ | | √ | | √ | | √ |
| Presentations to committee publics, local government, and/or environmental department | | | | | | | | | | √ |
| 11. Project management | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |

**Figure 4.** The detailed information for the performance plan. (For this RFA, a **30-month** project is proposed with a performed measurement period of **24** months, and an additional **3** months on either end for 1) preparation and procurement; and 2) for paper preparation and final reporting. )

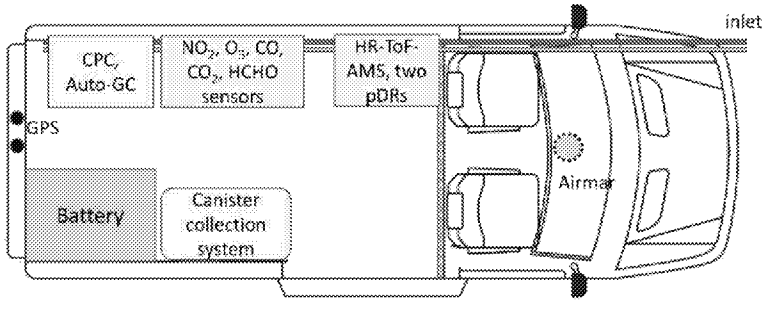


**Figure 5.** Proposed instruments layout for ASRC mobile lab

### *C. Timeline and Milestones*

Besides the general work plan, **Fig. 4** also shows the timeline and milestones for each task. In general,

- The second quarter of 2023 (**2023 Q2**) will be used for 1) Calibration, Testing, and Integration of the MODULAIR packages and the instruments for the ASRC mobile lab, 2) setting up the NY capital district community advisory group, and do project information with related community activities with the help from our contactor- Healthy Schools

Network, 3) installing the MODULAIRs, and (4) quarterly report at the end.

- The third quarter of 2023 (**2023 Q3**) will have MODULAR to start measurements for the next 24 months, the first ASRC mobile lab short-term measurements, and analyze this quarterly data and present to the first committee meeting for EPA project advisory committee, the first committee meeting for the NY capital district community advisory committee at the end.
- The fourth quarter of 2023 (**2023 Q4**) will have the quarterly report at the end.
- The first quarter of 2024 (**2024 Q1**) will have the second ASRC mobile lab short-term measurements, the second committee meeting, and a quarterly report at the end.
- The second quarter of 2024 (**2024 Q2**) will have the quarterly report at the end.
- The third quarter of 2024 (**2024 Q3**) will have the third ASRC mobile lab short-term measurements, the third committee meeting, and the quarterly report at the end.
- The fourth quarter of 2024 (**2024 Q4**) will have the one and half year's result shown at the national conference (e.g., AGU Fall Meeting 2024), starting journal papers organization, a quarterly report at the end.
- The first quarters of 2025 (**2025 Q1**) will have the fourth ASRC mobile lab short-term measurements, the fourth committee meetings, and also the quarterly report at the end.
- The first quarters of 2025 (**2025 Q2**) will have the end of the instrument deployments, the second community activities will be organized with results showing the community air quality levels and the temporal pollutants variation, and also the quarterly report at the end.
- The second/third quarters of 2025 (**Q3**) will have the synthesis of data and results and have the final committee meetings. Two journal papers will be submitted /or been published. One special meeting will be organized where more government officers and community publics will be invited and the two-year results will be shown, as well as the community-based air quality standards.

## Section 6 – Programmatic Capability and Past Performance

### *A. Past Performance*

No past performance for PI: Jie Zhang as a new research scientist.

### *B. Reporting Requirements*

No reporting requirements for PI: Jie Zhang as a new research scientist.

**C. Staff Expertise** The PI Dr. Zhang has strong experience in field measurements, including the field campaigns at Whiteface Mountain in 2017 for aerosol-cloud interplay, at Pinnacle State Park in 2017 for aerosol-fog interplay, at Long Island in 2018/2019 for Long Island Sound Tropospheric Ozone Study, and for NY state in 2021/2022 for the New York State Methane emission on-road measurements, and in data organization and paper publications (as shown in CV).

Co-PI Md. Aynul Bari has more than 10 years of experience in assessing air quality issues in urban, suburban, and rural areas at numerous locations across Canada (Alberta) and in Europe (Germany, Cyprus). He was a leading researcher in the Health Canada funded indoor air quality study conducted in the Capital Region of Alberta (Edmonton) and currently leading indoor and outdoor air quality study in NYS Capital Region (UAlbany internal grant) through citizen science approach

and co-leading fine-scale monitoring in NYC using low-cost sensors (funded by New York State Energy Research and Development Authority- NYSERDA).

Research Scientist Dr. Schwab has worked closely with DEC and NYSERDA personnel on numerous projects and will use these contacts to guide PI Dr. Zhang to make the scientific and policy-relevant findings of the proposed work known to these important target audiences.

## Section 7 –Budget Table

| Line Item & Itemized Cost | EPA Funding |
|---|---|
| **Personnel** | |
| (1) PI Dr. Zhang @ $40/hr x 40 hrs/wk x 16 wks | $25,600 |
| (2) Co-PI Dr. Bari @ $70/hr x 40 hrs/wk x 8 wks | $22,400 |
| (3) Research Scientist Dr. Schwab @ $80/hr x 20 hrs/wk x 8 wks | $12,800 |
| (4) lab project manager Janie Schwab @ $32/hr x 20 hrs/wk x 8wks | $5,120 |
| (5) Graduate Student Reseach Assistant @ $27.4/hr x 20 hrs/wk x 104 wks | $57,000 |
| (6)Undergraduate Student Research Assistant @ $15/hr*10hrs/wk*104 wks | $15,600 |
| TOTAL PERSONNEL | $138,520 |
| **Fringe Benefits** | |
| PI, PT PM and Lab PM @ RF regular employee rate of 40% | $17,408 |
| Co-PI summer faculty rate @14% | $3,136 |
| Grad student rate @ 13% | $7,410 |
| Undergraduate rate @ 6% | $936 |
| TOTAL FRINGE BENEFITS | $28,890 |
| **Travel** | |
| Domestic conference @ 2581/person/trip x 4 person x 1 trip | $10,324 |
| TOTAL TRAVEL | $10,324 |
| **Equipment** | |
| 11 MODULAIR (outdoor) @ 5550/unit | $61,050 |
| TOTAL EQUIPMENT | $61,050 |
| **Supplies** | |
| Outreach Materials and Supplies | $3,000 |
| 1 Laptop computers @ $2000/unit | $2,000 |
| 5 Monitors for indoor MODULAIR @ $ 200/unit | $1,000 |
| TOTAL SUPPLIES | $6,000 |
| **Contractual** | |
| Community School Support @ 5 schools x $2500/each/year x 2 years | $25,000 |
| TOTAL CONTRACTUAL | $25,000 |
| **Other** | |
| Subaward (Healthy Schools Network) Costs @25000/year x 2 years | $50,000 |
| Final Community Meeting Logistics | $2,000 |
| 2 Community project information activity @ 1500/each | $3,000 |
| Tuition | $34,668 |
| Publications | $3,000 |
| TOTAL OTHER | $92,668 |

| | |
|---|---|
| **Total Direct Costs** | $362,452 |
| MTDC Base | $241,734 |
| **Indirect Charges** | |
| Indirect cost charged at the negotiated rate of 56.5% on MTDC (total direct costs less equipment, subcontracts over $25k and tuition.) Base = $242,734 | $136,580 |
| TOTAL INDIRECT | $136,580 |
| **TOTAL PROJECT COST** | **$499,032** |

*B. Reasonableness of Costs*

**PERSONNEL: PI Jie Zhang** requests 2 months of summer salary each year ($12,800 for one year, and a total of $25,600 for two years). Dr. Zhang will be responsible for overall project management, mentoring the graduate student, participating in all measurement deployments and data analysis, joining the committee meeting, and guiding manuscript preparation. **Co-PI Md. Bari** requests 1 month of summer salary each year ($11,200 for one year, and a total of $22,400 for two years). Dr. Bari will help with project management, measurement deployment, data analysis, and presentations. Research Scientist **Dr. James Schwab** requires a salary for 80 hours each year ($6400 for one year, and a total of $12,800 for two years), and will help with the project management and manuscript/presentation preparation. Total $60,800. **OTHER PERSONNEL**: **Part-time Lab manager** Janie Schwab requires a salary for 80 hours each year ($3200 for one year, and a total of $6,400 for two years), and will help with the instrument's calibration, testing, and integration. For the graduate student research assistant (PI group), we request 12 months of salary in each project year ($28,500 for one year, and a total of $57,000 for two years). The **graduate student** will be responsible for instrument installation/maintenance, data analysis, and manuscript writing. Meanwhile, we request 12 months of salary (half time) in each project year ($7,800 for one year, and a total of $15,600 for two years) for an **undergraduate research assistant** (Co-PI group), for working with the graduate student and helping deployment and data analysis. Total $77,720

**FRINGE BENEFITS:** Fringe benefits are charged according to the DHHS negotiated rate with the RFSUNY at 40% for PI, Co-PI at the summer faculty rate of 14%, 40% for the Lab Manager, 13% for graduate students, and 6% for undergraduate students. Fringe benefits includes medical, dental insurance, retirement, worker's comp, disability insurance and PTO. Total $28,890

**TRAVEL:** We request $10,324 for four people including PI Dr. Zhang, Project manager Dr. Schwab, one community committee, and the Graduate student for one domestic scientific conference (such as AGU Fall Meeting, $2581/person/trip): Airfare, $600; Registration, $585; Ground transportation, parking, and incidentals, $100; Lodging, $137 x 6 days = $822; Meals and per diem, $79 x 6 days = $474.

**EQUIPMENT:** We request $61,050 in the first year to purchase 11 units of MODULAIR packages, with one unit for $ 5550 including a MODULAIR for PM+ five gas-species, a Sonic Anemometer for wind information, and data cloud. Two units will be for each school (total of 10 units for 5 schools), one unit for our ASRC measurement shelter and the mobile lab.

**SUPPLIES:** We request $3000 for the outreach materials and supplies, such as the sample tube,

calibration gases, etc. We also request $2000 for one laptop computer, which will be used by the graduate student to analyze data and the manuscripts and presentations preparation. The laptop will be a mobile workstation style for a more reliable performance with larger memory and storage needs for the datasets produced in this project than the general office ones. Meanwhile, each school will need a video monitor to show the real-time air pollutants concentrations, and we request a total of $1000 for five monitors. Total $6,000

**CONTRACTUAL:** We request $25,000 for the costs of five schools ($2,500/year/school) to participate in the study.

**OTHER:** We request $50,000 for two years for **Subcontractor** Healthy Schools Network to assist with planning and coordinating the study with the community schools. $2,000 is requested for the final special committee meeting including community members and the government officers. $3,000 is requested for two community project information activities. We request two years of tuition for the graduate student at $34,668, and $3,000 for one or two journal publications (e.g., AGU community science, EGU AMT journals). Total $67,668

**INDIRECT COST RATE:** F&A charged at the federally negotiated rate of 56.5% on MTDC based on rate agreement dated 3/25/21. $136,580

### *C. Expenditure of Awarded Funds*

The RFSUNY sponsored programs office will manage all aspects of post-award administration, and the PI Dr. Zhang will ensure the external partner expends the grant funds in a timely and efficient manner.

## Reference

Bell, M. L., & Ebisu, K. (2012) Environmental inequality in exposures to airborne particulate matter components in the United States. Environmental health perspectives, 120(12), 1699-1704.
Freudenberg, N., et al. (2011) Strengthening community capacity to participate in making decisions to reduce disproportionate environmental exposures. American Journal of Public Health, 101(S1), S123-S130.
Jiao, W., et al. (2015) Field assessment of the village green project: An autonomous community air quality monitoring system. Environmental science & technology, 49(10), 6085-6092.
Keet, C. A., et al. (2018) Long-term coarse particulate matter exposure is associated with asthma among children in Medicaid. American journal of respiratory and critical care medicine, 197(6), 737-746.
Kerr, G. H., et al. (2021) COVID-19 pandemic reveals persistent disparities in nitrogen dioxide pollution. Proceedings of the National Academy of Sciences, 118(30).
UNEP (2022). Air Pollution Series: Actions on Air Quality in North America.

Manifest for Grant Application # GRANT13580320

Grant Application XML file (total 1):

1. GrantApplication.xml. (size 24776 bytes)

Forms Included in Zip File(total 6):

1. Form ProjectNarrativeAttachments_1_2-V1.2.pdf (size 16042 bytes)

2. Form SF424_3_0-V3.0.pdf (size 24136 bytes)

3. Form SF424A-V1.0.pdf (size 23306 bytes)

4. Form EPA4700_4_3_0-V3.0.pdf (size 23252 bytes)

5. Form OtherNarrativeAttachments_1_2-V1.2.pdf (size 15926 bytes)

6. Form EPA_KeyContacts_2_0-V2.0.pdf (size 37394 bytes)

Attachments Included in Zip File (total 2):

1. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1235-EPA-OAR-OAQPS-22-01-RFSUNY-Zhang-Final_Attach.pdf application/pdf (size 599901 bytes)

2. ProjectNarrativeAttachments_1_2 ProjectNarrativeAttachments_1_2-Attachments-1234-EPA-OAR-OAQPS-22-01-RFSUNY-Zhang-Final-V3.pdf application/pdf (size 472663 bytes)

## Section 5 Quality Assurance Statement

Dr. Zhang, the PI, will be responsible for the quality assurance and quality control aspects of the project, with the help of Dr. Schwab who has worked with QA officers from EPA, NYS DEC, and outside contractors towards the shared goal of high-quality data which meets or exceeds the quality assurance standards and data quality objectives (DQO's).

The ASRC general approach to quality research involving new and evolving instrumentation involves a combination of laboratory tests and evaluation combined with extended field deployments with ongoing QA checks and comparisons with collocated measurements of the same (or essentially the same) quantity with a different instrument and/or method. We have many years of producing quality-assured data and have submitted our data to NARSTO and EPA Supersites databases, and to AQS; as well as to our local data archive.

For this project, all MODULAIR packages will be tested in the ASRC lab with continuous running for two weeks for internal-comparison, and compared to other more precision instruments for calibration gas or ambient gas to get the correction/calibration relationship. We will produce SOP's (Standard Operating Procedures) for the setup and operation of the MODULAIR, and for data reduction, analysis, and reporting. Data packages will be transmitted over the internet (via FTP) from the measurement sites to the QuantAQ Cloud, and we will check data almost every day, and at least twice a week and upload these data to our ASRC data server (http://atmoschem.asrc.cestm.albany.edu/), which is free to register and get access.

Data management will include specific logbooks and check sheets for the laboratory and field operations of the ACSM. These records will be kept with the instrument, and periodically backup copies will be made for storage in Albany. All raw and processed data will be backed up on a regular schedule ranging from weekly to monthly. As noted above, all final data will be made available on an ASRC data server, and will be available to public access. We will make sure that health researchers at the New York State Department of Health and New York University (at a minimum) are aware of the data sets we have collected.

**Curriculum Vitae-PI**

# Jie Zhang

Atmospheric Sciences Research Center, University at Albany, SUNY, United States
Email: jzhang35@albany.edu Phone: +1 (518)4960037

Dr. Zhang's research interests include the sources of regional/local pollutants and their atmospheric evolution. He has experience using diverse platforms and instruments (i.e., Mobile lab measurements, station measurements and satellite measurements, etc) to study the interplay of the air pollutants (such as ozone, aerosol) with different atmospheric conditions (such as heatwave, fog/cloud, sea breeze circulation, etc) and the pollution levels responding to the emission reductions, with the aim to better understand the air pollutions and provide new view of the guidance for pollution controls.

## Education

| | | | |
|---|---|---|---|
| University at Albany (Advisors: Dr. James Schwab) | | Atmospheric Sciences | Ph.D. 2019 |
| Chinese Academy of Sciences | | Environmental Optics | M.Sc. 2015 |
| Qufu Normal University | Optical Information Science and Technology | | B.S. 2012 |

## Appointments

University at Albany, Postdoctoral Researcher, 02/2021-now (Advisors: Dr. James Schwab)

Colorado State University, Postdoctoral Researcher, 03/2020- 02/2021 (Advisor: Prof. Jeff Collett Jr)

University at Albany, Postdoctoral Researcher, 12/2019-02/2021(Advisors: Dr. James Schwab)

Royal Netherlands Meteorological Institute (Netherlands), Intern. Researcher, 03/2015-08/2015 (Advisors: Dr. Ronald van de A)

**Relevant Publications** (Full list available at: https://sites.google.com/view/jie-zhang-asrc)

**Zhang, J.**, et al.: Long Island enhanced aerosol event during 2018 LISTOS: Association with heatwave and marine influences. ***Environmental Pollution***, 2021.

**Zhang, J.**, et al.: Fog processing of aerosols in a rural forest environment: insights from high resolution aerosol mass spectrometry. ***Geophysical Research Letters***, 2020.

Lance, S., **Zhang, J.**, et al.: Overview of the CPOC Pilot Study at Whiteface Mountain, NY: Cloud Processing of Organics within Clouds (CPOC). ***Bulletin of the American Meteorological Society***, 2020.

**Zhang, J.**, et al.: Estimation of aerosol liquid water from optical scattering instruments using ambient and dried sample streams. ***Atmospheric Environment***. 2020.

**Zhang, J.**, et al.: Mobile laboratory measurements of high surface ozone levels and spatial heterogeneity during LISTOS 2018: Evidence for sea-breeze influence. ***J. Geophys. Res.-Amos***. 2020.

**Zhang, J.**, et al.: Detailed measurements of submicron particles from an Independence Day fireworks event in Albany, NY using HR-ToF-AMS. ***ACS Earth Space Chem***. 2019.

**Zhang, J.**, et al.: Observed below-cloud and cloud interstitial submicron aerosol chemical and physical properties on Whiteface Mountain, New York during August 2017. ***ACS Earth Space Chem.*** 2019.

**Zhang, J.**, et al.: Exploring the applicability and limitations of selected optical scattering instruments for PM mass measurement. **Atmos. Meas. Tech.**, 2018.

**Zhang, J.**, et al.: Detection and emission estimates of NOx sources over China North Plain using OMI observations. ***International Journal of Remote Sensing***, 2018.

**Curriculum Vitae-Co-PI**

# Md. Aynul Bari

Assistant Professor, Department of Environmental & Sustainable Engineering, University at Albany, State University of New York (SUNY)
Email: mbari@albany.edu Phone: +1 518-437-4933

## EDUCATION

| Institution | Location | Degree | Dates |
|---|---|---|---|
| Bangladesh University of Engineering and Technology | Dhaka, Bangladesh | BSc, Civil Engineering | 1995-2000 |
| University of Stuttgart | Stuttgart, Germany | M.Sc., Environmental Engineering | 2002-2004 |
| University of Stuttgart | Stuttgart, Germany | PhD, Environmental Engineering | 2004-2009 |
| University of Alberta | Edmonton, Alberta | Research Associate, Air Quality | 2011-2018 |

## POSITIONS AND EMPLOYMENT

Jan. 2009-Dec. 2009 Scientific Staff, Department of Air Quality Control, University of Stuttgart
Dec. 2009-Nov. 2010 NSERC Fellow, Environment and Climate Change Canada, Toronto
2011-2013 Postdoctoral Fellow, School of Public Health, University of Alberta, Canada
2014-2018 Research Associate, School of Public Health, University of Alberta, Canada
2018- Assistant Professor, Department of Environmental & Sustainable Engineering, University at Albany, State University of New York (SUNY)

## RESEARCH AND PROFESSIONAL EXPERIENCES

Dr. Bari's current research focuses on understanding far-field (ambient) and near-field (outdoors, indoors) exposure and sources of criteria air pollutants, air toxics and emerging contaminants, air quality trend analysis, source apportionment, assessment of local and long-range source impacts, evaluation of low-cost air pollution sensors, and exposure risk assessment.

## SELECTED PEER-REVIEWED PUBLICATIONS (SELECTED FROM 35 PUBLICATIONS)

Paul, S., **Bari, M.A.**, 2022. Elucidating sources of VOCs in the Capital Region of New York State: Implications to secondary transformation and public health exposure. *Chemosphere* (accepted).

Zaman, S.U., Pavel, M.R.S., Joy, K.S., Jeba, F., Islam, M.S., Paul, S., **Bari, M.A.**, Salam, A., 2021. Spatial and temporal variation of aerosol optical depths over six major cities in Bangladesh. *Atmosphere Research*.

**Bari, M.A.**, Kindzierski, W.B., Roy, P., 2020. Identification of ambient $SO_2$ sources in industrial areas in the Lower Athabasca Oil Sands Region of Alberta, Canada. *Atmospheric Environment* 231, 117505.

Xiong, Y., **Bari, M.A.**, Xing, Z., Du, K., 2020. Ambient volatile organic compounds (VOCs) in two coastal cities in western Canada: Spatiotemporal variation, source apportionment, and health risk assessment. *Science of the Total Environment* 706, 135970.

**Bari, M.A.**, Kindzierski, W.B., 2017. Concentrations, sources and human health risk of inhalation exposure to air toxics in Edmonton, Canada. *Chemosphere* 173, 160–171.

**Bari, M.A.**, Kindzierski, W.B., 2017. Ambient fine particulate matter ($PM_{2.5}$) in Canadian oil sands communities: Levels, sources and potential risk for public health. *Science of the Total Environment* 595, 828–838.

**Bari, M.A.**, Kindzierski, W.B., Wallace, L., et al., 2015. Indoor and outdoor levels and sources of sub-micron particulate matter ($PM_1$) at homes in Edmonton, Canada. *Environmental Science & Technology* 49, 6419–6429.

**Bari, M.A.**, Kindzierski, W.B., Wallace, L., et al., 2015. Source apportionment of indoor and outdoor volatile organic compounds at homes in Edmonton, Canada. *Building and Environment* 90, 114–124.

**Curriculum Vitae-Research Scientist**

# James Jerome Schwab

Atmospheric Sciences Research Center
University at Albany - State University of New York
251 Fuller Road Albany, New York 12203
Phone: (518) 437-8754 FAX: (518) 437-8758 Email: jschwab@albany.edu

**Education**

**Harvard University**
Ph.D., 1983, Chemical Physics. Field: Atmospheric Chemistry
**University of Minnesota**
B.S., 1977, Physics, magna cum laude.

**Appointments**

1988 - present; Senior Research Associate/Research Professor, ASRC, University at Albany
2011-2013 Interim Director, ASRC
1983 –1988; Research Fellow, Harvard University
1978 – 1983; Graduate Research Assistant, Harvard University

**Joint Appointments**

1988 - present; Research Professor, Department of Atmospheric and Environmental Sciences, UAlbany.
1988 - present; Adjunct Professor, Department of Chemistry, UAlbany

**Research Experience**

1994 - present: Pinnacle State Park Field Site, Addison, NY; and Whiteface Mountain, Wilmington, NY. Principal Investigator and Lead Scientist. Responsible for selecting, outfitting, and operating these atmospheric chemistry research sites. Measurements of ozone and ozone precursor gases began in 1988 (Whiteface) and 1995 (Pinnacle); and measurement of $PM_{2.5}$ and PM precursors began in 1999. PI on numerous special studies at these site.

2016-2019: Integrated Effects of the Effects of NH3, NOx, PM, SO2, and VOC Emissions on O3 and PM2.5 Concentrations in New York State, worked with EPRI, ARA, and Envair on project involving detailed $NO_y$ measurement at PSP and QC.

2018-19: LISTOS Long Island Summer Intensive, Flax Pond Marine Laboratory. Responsible for Sprinter van mobile laboratory measurement, including outfitting van and choosing deployment tracks. Assisted with ozone sonde launches.platforms.

2009 NYSERDA Summer Intensive, 2004: PMTACS-NY Winter Intensive & 2001: PMTACS-NY Summer Intensive, Queens, NYC. Site Operations Manager. Responsible for multiple instruments and all logistics, including electrical modifications to site buildings and all interactions with Queens College personnel.

1988 – 1994: Designed, tested and built infrared lased based instruments for the measurement of atmospheric $CH_4$ and $H_2O_2$.

1983 – 1988: (Harvard University) Measurement of kinetic rate constants; and design, testing and deployment of airplane and balloon-borne instrumentation.

**Publications – Peer Reviewed:** Ninety plus papers in peer-reviewed journals – full list available upon request.
**Presentations:** Roughly fifty presentations as lead or co-lead presenter, another seventy plus as additional author. Full list available upon request.
**Research Support:** Principal Investigator on projects from NYSERDA, NSF, NASA, and NOAA. Co-PI on projects from above agencies and EPA, DOE and EESERCO. Full list available upon request.

**Internal Revenue Service**
**Director, Exempt Organizations**
**Rulings and Agreements**

**Date:** APR 11 2008

**Department of the Treasury**
**P.O. Box 2508**
**Cincinnati, Ohio 45201**

**Employer Identification Number:**
14-1368361
**Person to Contact - ID#:**
Sirijun Mayi - #31-07372
**Contact Telephone Number:**
877-829-5500 Phone
**Public Charity Status:**
509(a)(1) and 170(b)(1)(A)(vi)

The Research Foundation of State
University of New York
c/o Brian K Haynes
Bond, Schoeneck & King PLLC
One Lincoln Center
Syracuse, NY 13202-1355

Dear Applicant:

Our letter dated November 7, 1951 stated that you were exempt from Federal income tax under section 501(c)(3) of the Internal Revenue Code and classified as a public charity under sections 509(a)(1) and 170(b)(1)(A)(iv) and later modified to section 509(a)(3) of the Code.

Based on the information you submitted, we have modified your public charity status to the Code section listed in the heading of this letter. The effective date of your reclassification is July 1, 2007. Since your exempt status was not under consideration, you continue to be classified as an organization exempt from Federal income tax under section 501(c)(3) of the Code.

Publication 557, Tax-Exempt Status for Your Organization, provides detailed information about your rights and responsibilities as an exempt organization. You may request a copy by calling the toll-free number for forms, 800-829-3676. Information is also available on our Internet Web Site at www.irs.gov.

We have sent a copy of this letter to your representative as indicated in your power of attorney.

Because this letter could help resolve any questions regarding your exempt status, you should keep it in your permanent records.

If you have any questions, please call our toll free number shown in the heading of this letter.

Sincerely,

Robert Choi

Robert Choi
Director, Exempt Organizations
Rulings and Agreements

## Proof of Nonprofit Status-Healthy Schools Network

INTERNAL REVENUE SERVICE
P. O. BOX 2508
CINCINNATI, OH 45201

DEPARTMENT OF THE TREASURY

Date: NOV 20 2003

HEALTHY SCHOOLS NETWORK INC
773 MADISON AVE
ALBANY, NY 12208-0000

Employer Identification Number:
31-1642434
DLN:
17053277725023
Contact Person:
ERIC J BERTELSEN ID# 31323
Contact Telephone Number:
(877) 829-5500
Public Charity Status:
170(b)(1)(A)(vi)

Dear Applicant:

Our letter dated April 1999, stated you would be exempt from Federal income tax under section 501(c)(3) of the Internal Revenue Code, and you would be treated as a public charity during an advance ruling period.

Based on our records and on the information you submitted, we are pleased to confirm that you are exempt under section 501(c)(3) of the Code, and you are classified as a public charity under the Code section listed in the heading of this letter.

Publication 557, Tax-Exempt Status for Your Organization, provides detailed information about your rights and responsibilities as an exempt organization. You may request a copy by calling the toll-free number for forms, (800) 829-3676. Information is also available on our Internet Web Site at www.irs.gov.

If you have general questions about exempt organizations, please call our toll-free number shown in the heading between 8:00 a.m. - 6:30 p.m. Eastern time.

Please keep this letter in your permanent records.

Sincerely yours,

Lois G. Lerner
Director, Exempt Organizations
Rulings and Agreements

Letter 1050 (DO/CG)

## Partnership Letter

HEALTHY SCHOOLS NETWORK, INC.

153 Regent Street, Ste. 1050
Saratoga Springs, NY 12866
T 518-462-0632

www.HealthySchools.org
www.CleaningforHealthySchools.org
www.NationalHealthySchoolsDay.org

March 23, 2022- via email to Jie Zhang/SUNY RF

**To Whom It May Concern:**

Healthy Schools Network is a 501ce not for profit founded in 1995 whose virtual national office is in the Albany, NY Capital District. As executive director, I am writing to confirm our support for and participation in a proposed Air Quality Monitoring project to be funded by a grant from US EPA to the Research Foundation for the SUNY, "NY Capital District Communities air quality measurement network based on low-cost sensors with community schools as sites and mobile lab measurements." The PI is Dr. Jie Zhang, the co-PI is Aynul Bari, MD.

A NY Capital District communities air quality measurement network will be built based on low-cost sensors outdoor/indoor measurements with five community schools as sites and mobile lab measurements, which will provide the air pollution outdoor/indoor exposure estimations and promote further policies to better the air quality.

Healthy Schools Network will be the primary sub-contractor on the project at a consulting rate of $1,000 per day, up to $25,000 per annum; its IRS LoD is attached. Since its founding in NYS in 1995, Healthy Schools Network (HS Network) has worked to secure new laws, funding, and regulations to promote healthier school environments for all children in NYS, including testing for lead and remediating school drinking water to 5ppb, policies to protect occupant health in schools under renovation, prior notice of pesticide use, bans on arsenic, elemental mercury, and herbicides, comprehensive state regulations on indoor air in schools, and an executive order and state law requiring all state agencies and public and private schools to use green cleaning products. It has also fostered the development of local and statewide coalitions in other states to help improve the environmental conditions and practices of public schools.

For this project: HS Network will work with the PI, as described in the proposal text, to: (1) review and advise on selecting local schools; (2) participate in creating and editing flyers or literature to share with local schools and communities to explain the project and how it will benefit schools, personnel, and students, and importantly, how schools can participate; (3) recruit, convene, and host a Capital District community advisory group to encourage and steer the local work; and, (4) submit timely reports on its activities on behalf of the project for required quarterly/final reports to US EPA.

Qualifications: executive director Claire Barnett, MBA, is a frequent speaker and convener on healthy schools issues, especially on indoor air issues. Recently she was a panelist on indoor air

for the American Industrial Hygiene Association, for Johns Hopkins SPH, and a presenter at ISIAQC in Honolulu in January 2022, and was an adviser to the Harvard COVID Collaborative. She served on EPA's School Air Toxics project, established by EPA Administrator Lisa Jackson (2009-2012), and was a founding member of EPA's school environment leadership team. She is currently a member of the NYS Education Department's Safe School Task Force and the NYSERDA Climate Change – Buildings Sector Work Group, as well as the NYS Department of Health's healthy schools environment committee. Under her leadership, HS Network has garnered several recognition awards from US EPA, from Green Seal, from American University, and from the American Public Health Association.

Statewide, HS Network maintains working relationships with the NYS PTA, NYS school facility directors and business officials, with state education, environment, energy, and health agencies, and with New York State United Teachers, as well as a host of other NGOs.

Also, on the HS Network team are:

- Jeff Jones, HS Network Communications. He is a long-time communications and media expert in the state capitol who lives in the in Albany area and whose children attended Albany public schools. He maintains working relationships with key legislators representing Albany in the state capitol.
- Glenda Young-Marquez, Program Manager, is completing her MPH at George Washington University. Prior to moving east, she spent five years working for the state of Arizona on risk management, for state agencies and including schools. During the pandemic, she lived with her family in Mexico.

We look forward to working on this project with EPA and with the Research Foundation of SUNY and its highly skilled researchers on this important research opportunity.

Sincerely,

Claire L. Barnett, MBA, Executive Director

ENC. IRS LoD -